REMARKS

Claims 1 and 3-21 are pending in the present application. In the Office Action mailed September 14, 2007, the Examiner rejected claim 1 under 35 U.S.C. §103(a) as being unpatentable over Mistretta et al. (USP 5,713,358) in view of Watts et al. (US Pub. 2003/0032877), further in view of Rose et al. (USP 6,815,952). The Examiner next rejected claims 3-5 under 35 U.S.C. §103(a) as being unpatentable over Mistretta et al. in view of Watts et al., further in review of Rose et al., and further in view of Jezzard, Peter "Physical Basis of Spatial Distortions in Magnetic Resonance Images" in: Bankman, Isaac N., Handbook of Medical Imaging Processing and Analysis (San Diego, Academic Press, 2000), pp. 425-435. Claims 6, 11, 13, and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Mistretta et al. in view of Rose et al.. Claims 7-10, 12, and 15-21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Mistretta et al. in view of Rose et al., and further in view of Jezzard.

The Examiner objected to claim 9, stating that the identifiers "first peripheral region" and "second peripheral region" are confusing. Applicant has amended claim 9 per the Examiner's suggestion and believes that the objection to claim 9 should therefore be withdrawn.

The Examiner rejected claim 1 under §103(a) as being unpatentable over Mistretta et al. in view of Watts et al. and further in view of Rose et al., stating that "Watts teaches: 'waiting a predetermined period of time before sampling a next region of k-space if the next region of k-space is a center region...'" and that "it would have been obvious to one of ordinary skill in the art at the time of the invention to have included the step 'and wherein the predetermined period of time is a function of peripheral region distance from the center region of k-space' of Rose in the method of Mistretta in view of Watts in order to optimize SNR and avoid eddy-current induced image distortions as explicitly taught by Rose...." *Office Action*, September 14, 2007, p. 5-6. Applicant respectfully disagrees. Specifically, Applicant believes that Watts et al. and Rose et al. fail to teach or suggest that which is called for in claim 1.

Watts et al. discloses a method/protocol for bolus-chase MR angiography. *Watts et al.* ¶24. A fluoroscopically triggered pulse sequence is used in which a recessed center-edge elliptical-centric view acquires data in the center of k-space 3 seconds into data acquisition. *Watts et al.*, ¶¶56-58. The 3 second shift of the acquisition of the center of k-space provides for better timing of the k-space center relative to the peak arterial concentration of a contrast agent prior to venous return, thus giving better arterial visualization. *Id.* Watts et al., however, fails to teach or suggest that the method disclosed therein waits a predetermined period of time before sampling a next region of k-space if the next region of k-space is a center region of k-space, as

called for in claim 1. Rather, Watts merely discloses that the initial acquisition of the k-space center is shifted to a few seconds into the scan. During this "delay" that is present before k-space center acquisition, Watts et al. discloses that "the time prior to the acquisition of the [k-space] center is still used to acquire data, but not the very center of k-space." *Watts*, ¶96. Thus, there is simply no disclosure in Watts et al. that there is any predetermined period of time between the acquisition of data not in the center of k-space and the acquisition of data from the center region of k-space. The Examiner has read more into the reference than what is there - there is no "delay" or predetermined period of time that passes between acquisition of regions of k-space but only a shift in the acquisition of data from the center region of k-space that is immediately preceded by acquisition of data not in the center of k-space. Furthermore, no other "delays" are taught or suggested in Watts other than the initial shifting of the first sampling of the k-space center, and as such, Watts fails to teach or suggest waiting a predetermined period of time before sampling a next region of k-space if the next region of k-space is a center region of k-space.

Referring now to Rose et al., a method of eddy current compensated diffusion imaging using MR is disclosed therein. *Rose et al.*, Col. 1, lns. 41-43. A spin echo signal is obtained in a readout time window by excitation of a nuclear resonance signal and gradient pulses are applied to avoid distortions in a generated image that are due to eddy current production. *Rose et al.*, Col. 1, ln. 43 to Col. 2, ln. 17. The diffusion gradient pulses have a polarity, which is alternated between successive gradient pulses such that the totality of the gradient pulses having a gradient time integral between a time of said excitation and of the center of k-space that is equal to zero. *Id.* Rose et al., however, fails to teach or suggest a delay of a predetermined period of time between sampling of k-space regions that is a function of peripheral region distance from the center region of k-space, as is called for in claim 1. Rather, Rose merely teaches a method of eddy current compensation in which diffusion gradient pulses are applied having alternating polarities and having a total gradient time integral of zero. The method taught in Rose et al. is a method that avoids problems caused by eddy currents by negating the effects of these eddy currents via gradients of opposite polarity being applied. To the extent that Rose et al. does disclose any "delay" before a center of k-space, there is simply no teaching or suggestion in Rose et al. of the delay being of a predetermined period of time between sampling of k-space regions that is a function of peripheral region distance from the center region of k-space, as is called for in claim 1. As such, Rose et al. fails to teach or suggest that which is called for in claim 1. Therefore, for at least the reasons set forth above, claim 1 and the claims dependent therefrom are patentably distinct over the combination of cited references.

The Examiner rejected claims 6 and 14 under §103(a) as being unpatentable over Mistretta et al. in view of Rose et al. Each of claims 6 and 14 calls for, in part, a computer programmed to delay sampling of the center of k-space as a function of the distance an immediately preceding sampled peripheral region is from the center of k-space. In rejecting the claims, the Examiner stated that Rose discloses the "dependence of k-space MR signal sampling on the distance of 'an immediately preceding sampled peripheral region is from the center region....'" *Office Action*, supra at 10. Applicant respectfully disagrees.

As set forth in detail above, Rose et al. discloses a method of eddy current compensated diffusion imaging in which gradient pulses are applied to avoid distortions in a generated image that are due to eddy current production. *Rose et al.*, Col. 1, ln. 43 to Col. 2, ln. 17. The diffusion gradient pulses have a polarity, which is alternated between successive gradient pulses such that the totality of the gradient pulses having a gradient time integral between a time of said excitation and of the center of k-space is equal to zero. *Id.* Rose et al., however, fails to teach or suggest a delay of a predetermined period of time between sampling of k-space regions that is a function of peripheral region distance from the center region of k-space, as is called for in claims 6 and 14. Rather, Rose merely teaches a method of eddy current compensation in which diffusion gradient pulses are applied having alternating polarities and having a total gradient time integral of zero. To the extent that Rose et al. does disclose a "delay" before sampling a center of k-space, there is simply no teaching or suggestion in Rose et al. that this delay is dependent on the distance that an immediately preceding sampled peripheral region is from the center region of k-space. In asserting such, Applicant believes that the Examiner has mischaracterized the teachings of Rose et al.

In addition to Rose et al.'s failure to teach that which is called for in claims 6 and 14, Mistretta et al. also fails to teach or suggest the elements called for in those claims. That is, Mistretta et al. also fail to teach or suggest a delay of a predetermined period of time between sampling of k-space regions that is a function of peripheral region distance from the center region of k-space, and the Examiner has admitted such by stating that any delaying of sampling of k-space regions. *See Office Action*, supra at 10. Therefore, as neither of the cited references teach or suggest the delaying of sampling of the center of k-space as a function of the distance an immediately preceding sampled peripheral region is from the center of k-space, as called for in each of claims 6 and 14, the combination of cited references fail to teach all the elements of those claims. As such, Applicant believes that claims 6 and 14, and the claims dependent therefrom, are patentably distinct over Mistretta et al. and Rose et al.

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1 and 3-21.

Applicant appreciates the Examiner's consideration of these Amendments and Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

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General Authorization and Extension of Time

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 07-0845. Should no proper payment be enclosed herewith, as by credit card authorization being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 07-0845. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extensions under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 07-0845. Please consider this a general authorization to charge any fee that is due in this case, if not otherwise timely paid, to Deposit Account No. 07-0845.

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